Hull Retirement System

Actuarial Valuation Report

January 1, 2018

PUBLIC EMPLOYEE RETIREMENT ADMINISTRATION COMMISSION
COMMONWEALTH OF MASSACHUSETTS

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1. INTRODUCTION & CERTIFICATION

This report presents the results of the actuarial valuation of the Hull Contributory Retirement System. The valuation was performed as of January 1, 2018 pursuant to Chapter 32 of the General Laws of the Commonwealth of Massachusetts. There were several changes to the actuarial assumptions in this valuation. The investment return assumption was reduced from 7.75% to 7.40%, the salary increase assumption was changed from 4.5% to PERAC's standard salary increase assumption, and the mortality assumption reflects PERAC's standard mortality assumption used in 2017 valuations but adjusted to reflect the anticipated impact of the local system retiree mortality study currently in progress.

This valuation was based on member data as of December 31, 2017, which was supplied by the Retirement Board. Such tests as we deemed necessary were performed on the data to ensure accuracy. Asset information as of December 31, 2017 was provided in the Annual Statement for the Financial Condition as submitted to this office in accordance with G.L. c. 32, ss. 20(5)(h), 23(1) and 23(2)(e). Both the membership data and financial information were reviewed for reasonableness, but were not audited by us.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions, changes in economic and demographic assumptions, increases or decreases expected as part of natural operation of the methodology used for these measurements such as additional contribution requirements based on the plan's funded status and changes in plan provisions or applicable law. As part of this valuation, we have not performed an analysis of the potential range of future measurements.

I, James R. Lamenzo, am a member of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained in this report. In my opinion, the actuarial assumptions used in this report are reasonable, are related to plan experience and expectations, and represent our best estimate of anticipated experience under the system. I believe this report represents an accurate appraisal of the actuarial status of the system performed in accordance with generally accepted actuarial principles and practices relating to pension plans.

Respectfully submitted,
Public Employee Retirement Administration Commission

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Joseph E. Connarton
Executive Director

November 9, 2018

2. EXECUTIVE SUMMARY

PART A | COSTS UNDER CURRENT VALUATION

The principal results of the January 1, 2018 actuarial valuation are shown below.

Present Value of Future Benefits

Actives	$46,719,434
Retirees, Survivors, and Inactives	43,970,637
Total	$90,690,071

Normal Cost

Total Normal Cost	$1,688,262
Expected Employee Contributions	887,791
Net Normal Cost	$800,471

Actuarial Liability and Development of Unfunded Actuarial Liability

Actives	$31,847,124
Retirees, Survivors, and Inactives	43,970,637
Total	$75,817,761
Assets (Market Value)	48,465,175
Unfunded Actuarial Liability	$27,352,586

The Board recently adopted a funding schedule effective in FY19. The appropriation for FY19 under this funding schedule is shown on page 12 and the complete funding schedule is shown on page 13.

2. EXECUTIVE SUMMARY *(continued)*

PART B | COMPARISON WITH PRIOR VALUATION

The last full valuation was performed by Odyssey Advisors as of January 1, 2016. The investment return assumption was decreased from 7.75% to 7.40% effective with this valuation. The salary increase assumption was set to PERAC's standard assumption. The mortality assumption has been modified to reflect PERAC's standard assumption used in 2017 valuations but adjusted to reflect the anticipated result of our local system retiree mortality study currently in progress (see Part C). Other assumptions are based on our Local Experience Study Analysis issued in 2002. Below we have shown a comparison of the results between the two valuations.

	PERAC 1/1/18	Odyssey 1/1/16	Increase (Decrease)	% Increase (Decrease)
Total Normal Cost	$1,688,262	$1,804,346	($116,084)	(6.4%)
Expected Employee Contributions	887,791	924,198	(36,407)	(3.9%)
Net Normal Cost	$800,471	$880,148	($79,677)	(9.1%)
Actuarial Liability				
Actives	$31,847,124	$27,852,505	$3,994,619	14.3%
Retirees and Inactives	43,970,637	37,641,970	6,328,667	16.8%
Total	$75,817,761	$65,494,475	$10,323,286	15.8%
Assets (Market Value)	48,465,175	38,527,396	9,937,779	25.8%
Unfunded Actuarial	$27,352,586	$26,967,079	$385,507	1.4%
Funded Ratio	63.9%	58.8%	5.1%	

2. EXECUTIVE SUMMARY *(continued)*

PART B | COMPARISON WITH PRIOR VALUATION *(continued)*

Actives	PERAC 1/1/18	Odyssey 1/1/16	% Difference
Number	170	177	(4.0%)
Total Payroll	$10,062,298	$9,701,015	3.7%
Average Salary	$59,190	$54,808	8.0%
Average Age	50.9	50.7	0.4%
Average Service	12.6	10.7	17.8%

Retirees and Survivors	PERAC 1/1/18	Odyssey 1/1/16	% Difference
Number	143	143	0.0%
Total Benefits*	$4,352,726	$3,866,007	12.6%
Average Benefits*	$30,439	$27,035	12.6%
Average Age	71.9	N/A	N/A

**excluding State reimbursed COLA*

2. EXECUTIVE SUMMARY *(continued)*

PART C | FUNDED STATUS AND PLAN EXPERIENCE SINCE PRIOR VALUATION

Funded Status

The unfunded actuarial liability (UAL) and funded ratio are measures of the plan's funded status. These measures reflect the plan's position as of January 1, 2018. We believe these measures by themselves are not appropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations or assessing the need for or the amount of future contributions. However, we believe these measures, in conjunction with the plan's funding schedule shown on page 13, are appropriate for assessing the amount of future contributions.

Plan Experience

Plan Liabilities
Using the prior actuarial valuation results, the system experienced a gain on the actuarial liability of approximately $475,000 since the last valuation (the actuarial liability is less than expected). We believe this gain is primarily due to pay for continuing active members increasing less than assumed. This gain is determined before reflecting the assumption changes discussed in the next section.

However, we noted several inconsistencies with the 2016 valuation results and could not reconcile our results with them. To attempt to better assess our results, we also reviewed the System's 2014 and 2012 valuations. The 2016 and 2014 valuations were prepared by Odyssey Advisors. The 2012 valuation was prepared by Stone Consulting.

Our comparison of valuation results each year reflects essentially the same actuarial assumptions as used in the 2012 actuarial valuation. We determined the January 1, 2018 total normal cost as a percent of pay to be 14.6% on this basis. This matches Stone's 2012 figure. The 2014 Odyssey figure is 15.8% of pay which is somewhat higher but does not appear unreasonable. However, the 2016 figure is significantly higher at 18.6% of pay. Meanwhile, the actuarial liability increased only 1.5% over the 2-year period from 2014 to 2016 in the Odyssey reports. This is lower than we would expect as actuarial liability typically increases 3% - 5% per year.

We believe it is possible that the method of allocating normal cost and actuarial liability was altered in the 2016 valuation thus driving up the normal cost and decreasing the active member actuarial liability. This type of allocation shift could occur due to a coding change in the actuarial valuation program or a change in the plan actuary using a different software system. The Present Value of Benefits (PVB or the value of all benefits expected to be paid from the plan in the future) is the basic building block used to develop both the normal cost (the present value of benefits expect to be earned in the current year) and the actuarial liability (the value of plan liabilities based on members' service to date or, said another way, the sum of past normal costs). We do not have the PVB from the 2012, 2014, and 2016 valuations to make a comparison. I spoke with the Odyssey actuary about this issue and he indicated there was no change in the software system or a program coding change that he could recall. He did not know the reason for the difference in results from 2014 to 2016 and would have to look further to determine what happened. I indicated that since the 2016 results appear to be an outlier, and our results are consistent with the 2012 and 2014 valuations, as well as other recent valuations performed by PERAC and other private actuaries, we would go forward with our results.

2. EXECUTIVE SUMMARY *(continued)*

PART C | FUNDED STATUS AND PLAN EXPERIENCE SINCE PRIOR VALUATION *(continued)*

Plan Assets
The Board has consistently used the market value of assets (MVA) in determining its unfunded actuarial liability. There was an asset gain on a market value basis of approximately $4.0 million over the 2-year period. The rates of return on a market value basis in 2016 and 2017 were 8.1% and 17.8% respectively. We maintained the market value approach as part of this actuarial valuation but are available to discuss this further.

Actuarial Assumptions

Investment Return
For local retirement systems, PERAC's "standard" investment return assumption was 8.0% in our 2012 actuarial valuations. This had been our standard assumption (assuming a reasonable asset allocation) for over 15 years. Beginning with our January 1, 2013 actuarial valuations of local systems, we generally recommended an investment return assumption of 7.75%. For our January 1, 2015 actuarial valuations, we recommended reducing this assumption further. For our 2016 actuarial valuations, we generally recommended a 7.50% assumption, and in 2017 we generally recommended a range of 7.25% - 7.40%, partially depending on the assumption used in the prior actuarial valuation. The trend both in Massachusetts and across the country over the past 15 years has been to steadily reduce this assumption.

Early this year, NEPC, PRIT's investment consultant, provided figures for 30-year expected return projections using a building block approach and the target allocation and expected long-term returns by asset class. The expected annual return is 7.7% (7.2% assuming expenses of 50 basis points and the expected return reflects a gross return) in this study. This figure was reduced 10 basis points from the study released last year. Note that the 7.7% average expected return does not mean that the expected return each year will be 7.7%. In fact, over the shorter term (5-7 years) the average expected return is 6.6%. Greater expected returns in later years determined NEPC's long-term projection. Projected returns are one measure we use to determine the long-term investment return assumption.

A comparison of recent expected return projections as well as historical PRIT returns is shown below.

	Expected Annual Return						
	2012	2013	2014	2015	2016	2017	2018
5-7 year expected return	7.9%	7.4%	7.1%	6.8%	6.8%	6.8%	6.6%
30-year expected return	8.4%	8.2%	8.2%	7.9%	7.8%	7.8%	7.7%

Actual Returns as of December 31, 2017	
2017	17.7%
5 years (2013-2017)	9.9%
10 years (2008-2017)	5.6%
20 years (1998-2017)	7.7%
33 years (1985-2017)	9.7%

2. EXECUTIVE SUMMARY *(continued)*

PART C | FUNDED STATUS AND PLAN EXPERIENCE SINCE PRIOR VALUATION *(continued)*

We used the NEPC study to help determine a reasonable range for the investment return assumption for 2018 actuarial valuations. We are generally recommending an assumption of 7.15% - 7.40% for 2018 valuations of PRIT systems. Our recommendation for each system is based partially on the assumption used in the 2016 actuarial valuation.

As we indicated earlier, we generally recommended a 7.25% - 7.40% assumption in our 2017 local system valuations. As part of our analysis this year, we considered whether to recommend maintaining this range in our 2018 actuarial valuations or reducing the assumption further. Although, a case can be made to maintain our 2017 range, we believe a stronger case can be made to slightly reduce this range. But since we did not perform an actuarial valuation of your plan as of January 1, 2017 (and thus did not consider reducing this assumption at that time), we do recommend reducing this assumption as part of the January 1, 2018 actuarial valuation to reflect the two-year period since the prior assumption was selected.

There are several reasons to reduce this assumption. As noted above, there was a decrease in the NEPC expected results from the prior year's analysis on both a short-term and long-term basis. Therefore, a corresponding reduction in the assumption is appropriate. Furthermore, we believe placing greater reliance on the short-term expectation is a reasonable approach. In addition, the most recent NASRA study (February 2018) shows the average investment return assumption used for about 130 large public plans across the country (7.36%) continues to decrease. The February 2017 NASRA study showed the average assumption to be 7.52%. Note that these results are for comparison only as differences in investment allocations were not considered in the NASRA studies.

The 7.36% national average shown above would decrease if the 2018 assumptions for all state systems were known and included. For example, the study does not include the decision earlier this year to use a 7.35% assumption for the Massachusetts State and Teachers' Retirement Systems (a reduction from 7.50%). If the trend to reduce this assumption continues, a 7.35% assumption may be seen as an outlier in a few years, whether justified or not.

The Board adopted a schedule using an assumption of 7.40%. This reflects a reduction in this assumption from 7.75%. We will continue to monitor this assumption and we may recommend decreasing this assumption as part of the January 1, 2020 actuarial valuation. A reduction in the investment return assumption increases the plan's liabilities.

This change increased the normal cost by approximately $110,000 and the actuarial accrued liability by approximately $2.47 million.

2. EXECUTIVE SUMMARY *(continued)*

PART C | FUNDED STATUS AND PLAN EXPERIENCE SINCE PRIOR VALUATION *(continued)*

Mortality
A revision to the actuarial standards of practice in 2010 required that future mortality improvements (longer life expectancy) be considered in valuations performed after July, 2011. To begin recognizing this change, as part of our January 1, 2011 local actuarial valuations, we used the RP-2000 mortality table projected 10 years with Scale AA (a mortality improvement scale). In our 2012, 2013 and 2014 valuations, we gradually extended the mortality improvement scale beyond the valuation date. In our 2014 valuations, we projected mortality improvement to 2022 for active members and 2017 for retirees.

Beginning with our January 1, 2015 actuarial valuations, we began using a "fully generational" mortality assumption. A fully generational projection is two-dimensional. The mortality improvement projection is developed based on both the age of a member and the calendar year. We used retiree mortality experience from the State Retirement System from 2012 to 2014 as a proxy in determining the mortality assumption for local systems. We found that the RP-2000 mortality table with projected mortality improvement using the more recently developed projection Scale BB and a base year of 2009 was appropriate for our 2015 valuations. We maintained that assumption in our 2016 and 2017 actuarial valuations.

A revised mortality table (the RP-2014 mortality table) was published in 2014. The revised table has no experience related to public plans. We found in our 2015 State analysis that the base table did not match our experience. In 2017, we did further analysis of retiree mortality for the State Retirement System based on deaths in 2015 and 2016. Again we found that our experience did not match the base table. However, we preferred to update our assumption to a version of the 2014 table. Based on our findings, we modified the State's assumption in the 2017 valuation to reflect a blue collar version of the RP-2014 table. We are currently analyzing retiree mortality for local systems and expect to determine a revised assumption by next year. For this valuation the assumption reflects the prior assumption we used for local systems with plan liabilities increased by 0.75% to recognize the anticipated impact of the assumption ultimately adopted after we complete our local system retiree mortality study.

The change increasing plan liability by 0.75% increased the normal cost by approximately $25,000 and the actuarial accrued liability by approximately $565,000. Note that your system did not use a generational mortality assumption in your prior valuation. The result of that change is included in the discussion in the next paragraph.

Other Assumptions
We adopted the standard PERAC demographic assumption set in performing this valuation. The principal change from your 2016 assumption is the adoption of a fully generational mortality assumption. Your 2016 valuation reflected a static mortality assumption projected with mortality improvement. Another less significant change is our salary increase assumption that varies by service and job group. It appears the retirement, termination, and disability rates used by Odyssey reflected the PERAC standard assumptions.

These changes increased the normal cost by approximately $80,000 and the actuarial accrued liability by approximately $1.64 million.

Overall Impact
The overall impact of these assumption changes increased the plan's normal cost by $215,000. The actuarial liability increased by approximately $4.675 million. The funding schedule shown in this report reflects these revised assumptions.

2. EXECUTIVE SUMMARY *(continued)*

PART C | FUNDED STATUS AND PLAN EXPERIENCE SINCE PRIOR VALUATION *(continued)*

Chapter 176 Provisions

Chapter 176 of the Acts of 2011, An Act Providing for Pension Reform and Benefit Modernization made a number of changes to the Chapter 32 pension law. There are several changes that will have the most impact on decreasing plan liabilities over the longer term. These include an increase in the normal retirement age by two years (for example, from age 65 to age 67 for Group 1 members), an increase in the age (early retirement) reduction factor for ages below the maximum age (from a 4.0% to a 6.0% annual reduction), and an increase in the period for determining a member's average annual compensation (from 3 years to 5 years). Since these changes are effective only for members hired after April 1, 2012, this is the third actuarial valuation to reflect these changes.

As of January 1, 2018, there were 67 members hired after April 1, 2012. Since these members have less than six years of service and are generally young, there is relatively little impact on plan costs in this valuation. The normal cost decreased approximately $50,000 and the actuarial liability decreased approximately $370,000 for these members compared to the figures under the prior provisions.

COLA Base

This valuation reflects a COLA base of $13,000. The 2016 valuation reflected the same base. As part of this valuation, the Board requested we determine the impact of increasing the COLA base to $14,000. This change would increase the normal cost by approximately $8,000 and would increase the actuarial liability by approximately $360,000. If the $14,000 COLA base were adopted and the UAL amortized as outlined in the funding schedule, the FY19 appropriation would increase approximately $43,000 and then increase by about 4.0% per year.

We recommend that if a system increases the COLA base, there should be a corresponding increase in appropriation to reflect the cost of the benefit enhancement.

Funding Schedule

The funding schedule presented in this report was recently adopted by the Board. The FY19 payment was maintained from the prior schedule. The total appropriation increases 4.0% each year through FY30 with a final amortization payment in FY31.

GASB 67/68

The auditors have requested we use the results of this valuation to prepare the Governmental Accounting Standards Board (GASB) disclosures for the fiscal year ending June 30, 2018 and the plan year ending December 31, 2017. The statements are commonly referred to as GASB 67 and GASB 68. GASB 67 relates to financial reporting for state and local government pension plans (plan financials). GASB 68 relates to financial reporting by state and local governments for pension plans (employer financials). We have used a measurement date of December 31 in each year we have provided these disclosures. We have not provided any GASB 67/68 exhibits in this report. These disclosure exhibits will be provided under separate cover.

2. EXECUTIVE SUMMARY *(continued)*

PART D | RISK

Risk is defined as the potential for differences in future plan measurements resulting from actual future experience deviating from actuarially assumed experience. The plan is subject to a number of risks that could affect the plan's future financial condition. Examples of risk include the following:

Investment risk – the potential that investment returns will be different than expected;

Asset/liability mismatch risk – the potential that changes in asset values are not matched by changes in the liabilities;

Interest rate risk – the potential that interest rates will be different than expected;

Longevity and demographic risk – the potential that mortality or other demographic experience will be different than expected;

Contribution risk – the potential that employer contributions to the plan will not be made, or will not be made at the assumed level. The System appropriated the amounts in its funding schedule since the last actuarial valuation.

Going forward, we will be identifying and assessing risk that, in our professional judgment, may reasonably be anticipated to significantly affect the plan's future financial condition.

3. SUMMARY OF VALUATION RESULTS

A. Number of Members on Current Valuation Date	
Active Members	170
Vested Terminated Members	7
Retired Members and Survivors	143
Total	320
B. Total Regular Compensation of Active Members	$10,062,298
C. Normal Cost	
Superannuation	$1,145,085
Death	114,182
Disability	336,800
Termination	92,195
Total Normal Cost	$1,688,262
Expected Employee Contributions	887,791
Net Employer Normal Cost	$800,471
D. Actuarial Liability	
Active	
Superannuation	$29,596,582
Death	509,500
Disability	1,399,677
Termination	341,365
Total Active	$31,847,124
Vested Terminated Members	329,595
Non-Vested Terminated Members	99,142
Retirees and Survivors	43,541,900
Total Actuarial Liability	$75,817,761
E. Actuarial Value of Assets	48,465,175
F. Unfunded Actuarial Liability: D – E	$27,352,586
G. Funded Ratio: E/D	63.9%

4. APPROPRIATION DEVELOPMENT FOR FISCAL YEAR 2019

PART A | DERIVATION OF APPROPRIATION

Cost Under Current Funding Schedule

1. a. Employer Normal Cost as of January 1, 2018	$800,471
b. Estimated Expenses	$175,000
c. Total Employer Normal Cost (a+b, adjusted for timing)	$1,017,579
2. Net 3(8)(c) payments	$125,000
3. a. Unfunded Actuarial Liability as of January 1, 2018	$27,352,586
b. FY19 amortization payment (13-year, 4.0% total appropriation increasing) *	$2,764,821
4. Total FY19 Payment [Sum of 1(c), 2, and 3(b)]	$3,907,400

* FY19 appropriation was maintained at the same level as the prior schedule.

All amounts assume payments will be made August 1 of each fiscal year.

4. APPROPRIATION DEVELOPMENT FOR FISCAL YEAR 2019
(continued)

PART B | CURRENT FUNDING SCHEDULE

Fiscal Year	Normal Cost	Net 3(8)(c)	Amort. of UAL	Total Cost	Unfunded Act. Liab.	Change in Cost
2019	1,017,579	125,000	2,764,821	3,907,400	28,364,632	
2020	1,063,370	125,000	2,875,326	4,063,696	27,511,750	4.0%
2021	1,111,222	125,000	2,990,022	4,226,244	26,477,775	4.0%
2022	1,161,226	125,000	3,109,067	4,395,294	25,244,830	4.0%
2023	1,213,482	125,000	3,232,624	4,571,105	23,793,548	4.0%
2024	1,268,088	125,000	3,360,861	4,753,950	22,102,957	4.0%
2025	1,325,152	125,000	3,493,955	4,944,108	20,150,348	4.0%
2026	1,384,784	125,000	3,632,088	5,141,872	17,911,149	4.0%
2027	1,447,099	125,000	3,775,447	5,347,547	15,358,772	4.0%
2028	1,512,219	125,000	3,924,230	5,561,449	12,464,461	4.0%
2029	1,580,269	125,000	4,078,638	5,783,907	9,197,123	4.0%
2030	1,651,381	125,000	4,238,882	6,015,263	5,523,148	4.0%
2031	1,725,693	125,000	1,414,577	3,265,270	1,406,214	-45.7%
2032	1,803,349	125,000		1,928,349	0	-40.9%

All amounts assume payments will be made August 1 of each fiscal year.
Total appropriation assumed to increase 4.0% each year until FY30, with a final amortization payment in FY31.
FY19 normal cost includes assumed expenses of $175,000 and is assumed to increase 4.5% per year.
FY19 appropriation was maintained at the same level as the prior schedule.

5. GASB INFORMATION

The actuarial information required by Governmental Accounting Standards Board (GASB) Statement Nos. 67 and 68 replaced the information required by Statement Nos. 25 and 27.

The information required by GASB 67 (plan) is to be reported and measured as of December 31 each year. For the initial measurement as of December 31, 2014, we rolled the liabilities forward from the prior valuation to December 31, 2014.

The information required by GASB 68 (employer) is to be reported as of the end of the fiscal year (June 30 for cities and towns). We are allowed to select a measurement date at any date during the fiscal year. For the initial measurement as of June 30, 2015, we selected a measurement date of December 31, 2014 which is consistent with GASB 67.

We have not provided any GASB 67 or 68 exhibits in this valuation report. We will provide the disclosure exhibits under separate cover.

Although GASB 25 no longer applies, we are including the schedule of funding progress previously required by the Statement to provide historical context.

Schedule of Funding Progress

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL)* (b)	Unfunded AAL (UAAL) (b-a)	Funded Ratio (a/b)	Covered Payroll (c)	UAAL as a % of Cov. Payroll ((b-a)/c)
1/1/2018	$48,465,175	$75,817,761	$27,352,586	63.9%	$10,062,298	271.8%
1/1/2016	$38,527,396	$65,494,475	$26,967,079	58.8%	$9,701,015	278.0%
1/1/2014	$34,820,803	$64,528,515	$29,707,712	54.0%	$9,293,846	319.6%
1/1/2012	$26,210,257	$59,993,728	$33,783,471	43.7%	$9,189,068	367.7%
1/1/2010	$22,241,000	$52,498,000	$30,257,000	42.4%	$8,705,000	347.6%

**excludes State reimbursed COLA*

6. PLAN ASSETS

A | BREAKDOWN OF ASSETS BY INVESTMENT TYPE

Cash and Cash Equivalents	$60,331
PRIT Cash	200,378
PRIT Fund	48,143,810
Accounts Receivable	60,833
Accounts Payable	(177)
Total	$48,465,175

B | BREAKDOWN OF ASSETS BY FUND

Annuity Savings Fund	$10,495,785
Annuity Reserve Fund	3,873,468
Pension Fund	2,553,419
Pension Reserve Fund	31,542,503
Total	$48,465,175

C | MARKET VALUE OF ASSETS $48,465,175

D | ACTUARIAL VALUE OF ASSETS $48,465,175

7. INFORMATION ON SYSTEM MEMBERSHIP

A critical element of an actuarial valuation is accurate and up-to-date membership information. PERAC conducted an extensive review of member data submitted for this valuation.

PART A | ACTIVE MEMBERS

	Actives	Vested Terminations
Number of Members	170	7
Average Age	50.9	56.8
Average Service	12.6	14.1
Average Salary	$59,190	$20,616
Average Annuity Savings Fund Balance	$60,086	$26,844

Age by Service Distribution of Active Members

Years of Service

Present Age	0 - 4	5 –9	10 - 14	15 - 19	20 - 24	25 - 29	30+	Total
0 - 24	4							4
25 - 29	9	1						10
30 - 34	4	4						8
35 - 39	0	7	3	1				11
40 - 44	6	3	4	3				16
45 - 49	4	3	5	2	5			19
50 - 54	13	1	4	5	3	2	3	31
55 - 59	3	4	5	10	3	3	5	33
60 - 64	4	2	4	3	3	2	1	19
65+	2	1	4	3	3	3	3	19
Total	49	26	29	27	17	10	12	170

7. INFORMATION ON SYSTEM MEMBERSHIP *(continued)*

PART A | ACTIVE MEMBERS *(continued)*

Salary by Age Distribution of Active Members

Present Age	Number of Members	Total Salary	Average Salary
0 - 24	4	$69,105	$17,276
25 - 29	10	$467,827	$46,783
30 - 34	8	$521,948	$65,244
35 - 39	11	$751,733	$68,339
40 - 44	16	$1,070,856	$66,929
45 - 49	19	$1,220,589	$64,242
50 - 54	31	$1,883,147	$60,747
55 - 59	33	$2,033,772	$61,629
60 - 64	19	$1,008,549	$53,082
65+	19	$1,034,772	$54,462
Total	170	$10,062,298	$59,190

7. INFORMATION ON SYSTEM MEMBERSHIP *(continued)*

PART B | RETIREES AND SURVIVORS

	Superannuation	Ordinary Disability	Accidental Disability	Survivors	Total
Number of Members	101	3	20	19	143
Average Age	72.4	56.1	71.1	72.3	71.9
Average Annual Benefit	$31,650	$22,136	$31,069	$26,899	$30,738

Benefit by Payment and Retirement Type

	Superannuation	Ordinary Disability	Accidental Disability	Survivors	Total
Total Annuity	$568,873	$11,604	$28,880	$36,977	$646,334
Pension (excluding State reimbursed COLA)	$2,620,327	$54,802	$570,753	$460,510	$3,706,392
State reimbursed COLA	$7,438	$0	$21,750	$13,590	$42,778
Total	$3,196,638	$66,406	$621,383	$511,077	$4,395,504

7. INFORMATION ON SYSTEM MEMBERSHIP *(continued)*

PART B | RETIREES & SURVIVORS *(continued)*

Benefit by Age Distribution

Present Age	Number of Members	Total Benefits	Average Benefits
Less than 40	0	$0	$0
40 - 44	0	$0	$0
45 - 49	1	$21,427	$21,427
50 - 54	4	$244,940	$61,235
55 - 59	6	$178,821	$29,804
60 - 64	17	$621,648	$36,568
65 - 69	42	$1,582,356	$37,675
70 - 74	25	$713,809	$28,552
75 - 79	22	$553,429	$25,156
80 - 84	12	$293,225	$24,435
85 - 89	7	$91,310	$13,044
90+	7	$94,539	$13,506
Totals	143	$4,395,504	$30,738

8. VALUATION COST METHODS

PART A | ACTUARIAL COST METHOD

The Actuarial Cost Method which was used to determine pension liabilities in this valuation is known as the *Entry Age Normal Cost Method***.** Under this method the *Normal Cost* for each active member on the valuation date is determined as the level percent of salary, which, if paid annually from the date the employee first became a member of the retirement system, would fully fund by retirement, death, disability or termination, the projected benefits which the member is expected to receive. The *Actuarial Liability* for each member is determined as the present value as of the valuation date of all projected benefits which the member is expected to receive, minus the present value of future annual Normal Cost payments expected to be made to the fund. Since only active members have a Normal Cost, the Actuarial Liability for inactives, retirees and survivors is simply equal to the present value of all projected benefits. The sum of Normal Cost and Actuarial Liability for each member is equal to the Normal Cost and Actuarial Liability for the Plan. The *Unfunded Actuarial Liability* is the Actuarial Liability less current assets.

The Normal Cost for a member will remain a level percent of salary for each year of membership except for changes in provisions of the Plan or the actuarial assumptions employed in projection of benefits and present value determinations. The Normal Cost for the entire system will also change due to the addition of new members or the retirement, death or termination of members. The Actuarial Liability for a member will increase each year to reflect the additional accrual of Normal Cost. It will also change if the Plan provisions or actuarial assumptions are changed.

Differences each year between the actual experience of the Plan and the experience projected by the actuarial assumptions are reflected by adjustments to the Unfunded Actuarial Liability. An experience difference which increases the Unfunded Actuarial Liability is called an *Actuarial Loss* and one which decreases the Unfunded Actuarial Liability is called an *Actuarial Gain.*

PART B | ASSET VALUATION METHOD

Assets are at market value.

9. ACTUARIAL ASSUMPTIONS

Investment Return

7.40% per year net of investment expenses *(prior assumption 7.75%)*

The investment return assumption is a long term assumption and is based on capital market expectations by asset class, historical returns, and professional judgment. We considered analysis prepared by PRIM's investment advisor using a building block approach which included expected returns by asset class, risk analysis, and the determination of a 30 year expected target rate of return.

Interest Rate Credited to the Annuity Savings Fund

3.5% per year

Assumed Rate of Cost of Living Increases (COLA)

3.0% per year (on the first $13,000 of an allowance)

Mortality

Pre-retirement mortality reflects RP-2000 Employees table projected generationally with Scale BB and a base year of 2009 (gender distinct). Plan liabilities are then increased .75% to reflect the anticipated impact of the assumption change after we complete our local system retiree mortality study. *(Prior assumption was the RP-2000 Mortality Table (gender distinct) projected to 2017 with Scale AA.)*

Post-retirement mortality reflects RP-2000 Healthy Annuitant table projected generationally with Scale BB and a base year of 2009 (gender distinct). Plan liabilities are then increased .75% to reflect the anticipated impact of the assumption change after we complete our local system retiree mortality study. *(Prior assumption was the RP-2000 Mortality Table (gender distinct) projected to 2017 with Scale AA.)*

For disabled members, the mortality rate is assumed to be in accordance with the RP-2000 Healthy Annuitant Table projected generationally with Scale BB and a base year of 2012 (gender distinct). Plan liabilities are then increased .75% to reflect the anticipated impact of the assumption change after we complete our local system retiree mortality study. *(Prior assumption was the RP-2000 Mortality Table (gender distinct) projected to 2010 with Scale AA (set forward two years).)*

It is assumed that 55% of pre-retirement deaths are job-related for Group 1 and 2 members and 90% are job-related for Group 4 members. For members retired under an Accidental Disability, 40% of deaths are assumed to be from the same cause as the disability.

We reviewed a sampling of a few local retirement systems and compared those results with the results we found in performing our analysis on the State Retirement System (SRS) for the years 2012-2014. We found the results comparable, so we used the same assumption for local systems that we used for SRS. For that analysis, the mortality assumptions reflect our recent experience analysis published in 2014 (based on the years 2006-2011), updated to reflect data through January 1, 2015 for post-retirement mortality, and professional judgment. In 2017, we performed additional analysis of SRS retiree mortality during 2015 and 2016. We adjusted the SRS assumption to a blue collar version of the RP-2014 table that increased the actuarial liability by approximately .75%. A local retiree mortality study is in progress. We have used our prior assumption with the results increased by .75% as a proxy for local system mortality until the local system study is completed. Our assumption reflects observed current mortality as well as expected mortality improvement.

9. ACTUARIAL ASSUMPTIONS *(continued)*

Salary Increase

Service	Group 1	Group 2	Group 4
0	6.00%	6.00%	7.00%
1	5.50%	5.50%	6.50%
2	5.50%	5.50%	6.00%
3	5.25%	5.25%	5.75%
4	5.25%	5.25%	5.25%
5	4.75%	4.75%	5.25%
6	4.75%	4.75%	4.75%
7	4.50%	4.50%	4.75%
8	4.50%	4.50%	4.75%
9	4.25%	4.50%	4.75%
10+	4.25%	4.50%	4.75%

(Prior assumption was 4.5% for all years of service.)

The salary increase assumption reflects both prior experience and professional judgment.

Withdrawal

Based on analysis of past experience. Annual rates are based on years of service. Sample annual rates for Groups 1 and 2 are shown below. For Group 4 members the rate is 0.015 each year for service up to and including 10 years. No withdrawal is assumed thereafter.

Service	Groups 1 & 2
0	0.150
5	0.076
10	0.054
15	0.033
20	0.020

Withdrawal rates are based on our most recent experience analysis which reviewed age, gender and job group. The assumption reflects this analysis as well as professional judgment.

9. ACTUARIAL ASSUMPTIONS *(continued)*

Disability

Based on an analysis of past experience. It is also assumed that the percentage of job-related disabilities is 55% for Groups 1 & 2 and 90% for Group 4.

Age	Groups 1 & 2	Group 4
20	0.00010	0.0010
30	0.00030	0.0030
40	0.00101	0.0030
50	0.00192	0.0125
60	0.00280	0.0085

Disability rates are based on our most recent experience analysis which reviewed age, gender and job group. The assumption reflects this analysis as well as professional judgment.

Expenses

An amount of $175,000 has been included in the Normal Cost for FY19. This amount includes estimated administrative expenses and a portion of the investment related expenses. This amount is assumed to increase by 4.5% each year.

Members Hired on or After April 2, 2012

Chapter 176 of the Acts of 2011 changed the retirement eligibility for the different job groups. For example, Group 1 eligibility changed from 55 years old with 10 years of service to 60 years old with 10 years of service (Chapter 176 removed the provision that allowed retirement at any age with 20 years of service). Our software system is programmed such that at any given age, a member is assumed to either retire or terminate, but not both. Therefore, we adjusted the retirement and termination rates for members impacted by Chapter 176. For example, for Group 1 members, we removed retirement rates for ages 50-59. Termination rates remain in effect for those years. We will monitor these assumptions going forward.

9. ACTUARIAL ASSUMPTIONS *(continued)*

Retirement

Age	Groups 1 & 2		Group 4
	Male	Female	
45-49	0.000	0.000	0.010
50	0.010	0.015	0.020
51	0.010	0.015	0.020
52	0.010	0.020	0.020
53	0.010	0.025	0.050
54	0.020	0.025	0.075
55	0.020	0.055	0.150
56	0.025	0.065	0.100
57	0.025	0.065	0.100
58	0.050	0.065	0.100
59	0.065	0.065	0.150
60	0.120	0.050	0.200
61	0.200	0.130	0.200
62	0.300	0.150	0.250
63	0.250	0.125	0.250
64	0.220	0.180	0.300
65	0.400	0.150	1.000
66	0.250	0.200	1.000
67	0.250	0.200	1.000
68	0.300	0.250	1.000
69	0.300	0.200	1.000
70 and after	1.000	1.000	1.000

Retirement rates are based on our most recent experience analysis which reviewed age, service, gender and job group. The assumption reflects this analysis as well as professional judgment.

10. SUMMARY OF PLAN PROVISIONS

ADMINISTRATION

There are 104 contributory retirement systems for public employees in Massachusetts. Each system is governed by a retirement board and all boards, although operating independently, are governed by Chapter 32 of the Massachusetts General Laws. This law in general provides uniform benefits, uniform contribution requirements and a uniform accounting and funds structure for all systems.

PARTICIPATION

Participation is mandatory for all full-time employees. Eligibility with respect to part-time, provisional, temporary, seasonal or intermittent employment is governed by regulations promulgated by the retirement board, and approved by PERAC. Membership is optional for certain elected officials.

There are 3 classes of membership in the retirement system:

Group 1:

General employees, including clerical, administrative, technical and all other employees not otherwise classified.

Group 2:

Certain specified hazardous duty positions.

Group 4:

Police officers, firefighters, and other specified hazardous positions.

MEMBER CONTRIBUTIONS

Member contributions vary depending on the most recent date of membership:

Prior to 1975:	5% of regular compensation
1975 - 1983:	7% of regular compensation
1984 to 6/30/96:	8% of regular compensation
7/1/96 to present:	9% of regular compensation
1979 to present:	an additional 2% of regular compensation in excess of $30,000.

In addition, members of Group 1 who join the system on or after April 2, 2012 will have their withholding rate reduced to 6 % after achieving 30 years of creditable service.

10. SUMMARY OF PLAN PROVISIONS *(continued)*

RATE OF INTEREST

Interest on regular deductions made after January 1, 1984 is a rate established by PERAC in consultation with the Commissioner of Banks. The rate is obtained from the average rates paid on individual savings accounts by a representative sample of at least 10 financial institutions.

RETIREMENT AGE

The mandatory retirement age for some Group 2 and Group 4 employees is age 65. Most Group 2 and Group 4 members may remain in service after reaching age 65. Group 2 and Group 4 members who are employed in certain public safety positions are required to retire at age 65. There is no mandatory retirement age for employees in Group 1.

SUPERANNUATION RETIREMENT

A person who became a member before April 2, 2012 is eligible for a superannuation retirement allowance (service retirement) upon meeting the following conditions:

- completion of 20 years of service, or
- attainment of age 55 if hired prior to 1978, or if classified in Group 4, or
- attainment of age 55 with 10 years of service, if hired after 1978, and if classified in Group 1 or 2

A person who became a member on or after April 2, 2012 is eligible for a superannuation retirement allowance (service retirement) upon meeting the following conditions:

- attainment of age 60 with 10 years of service if classified in Group 1, or
- attainment of age 55 with 10 years of service if classified in Group 2, or
- attainment of age 55 if hired prior to 1978, or if classified in Group 4.

10. SUMMARY OF PLAN PROVISIONS *(continued)*

AMOUNT OF BENEFIT

A member's annual allowance is determined by multiplying average salary by a benefit rate related to the member's age and job classification at retirement, and the resulting product by his creditable service. The amount determined by the benefit formula cannot exceed 80% of the member's highest three year (or five year salary as discussed below) average salary. For veterans as defined in G.L. c. 32, s. 1, there is an additional benefit of $15 per year for each year of creditable service, up to a maximum of $300.

• Salary is defined as gross regular compensation. For employees who become members after January 1, 2011, regular compensation is limited to 64% of the federal limit found in 26 U.S.C. 401(a)(17). In addition, regular compensation for members who retire after April 2, 2012 will be limited to prohibit "spiking" of a member's salary to increase the retirement benefit.

• For persons who became members prior to April 2, 2012, Average Salary is the average annual rate of regular compensation received during the 3 consecutive years that produce the highest average, or, if greater, during the last 3 years (whether or not consecutive) preceding retirement.

• For persons who became members on or after April 2, 2012, Average Salary is the average annual rate of regular compensation received during the 5 consecutive years that produce the highest average, or, if greater, during the last 5 years (whether or not consecutive) preceding retirement.

• The Benefit Rate varies with the member's retirement age. For persons who became members prior to April 2, 2012 the highest rate of 2.5% applies to Group 1 employees who retire at or after age 65, Group 2 employees who retire at or after age 60, and to Group 4 employees who retire at or after age 55. A .1% reduction is applied for each year of age under the maximum age for the member's group. For Group 2 employees who terminate from service under age 55, the benefit rate for a Group 1 employee shall be used.

• For persons who became members on or after April 2, 2012 and retire with less than 30 years of creditable service, the highest rate of 2.5% applies to Group 1 employees who retire at or after age 67, Group 2 employees who retire at or after age 62, and to Group 4 employees who retire at or after age 57. A .15% reduction is applied for each year of age under the maximum age for the member's group.

• For persons who became members on or after April 2, 2012 and retire with more than 30 years of creditable service, the highest rate of 2.5% applies to Group 1 employees who retire at or after age 67, Group 2 employees who retire at or after age 62, and to Group 4 employees who retire at or after age 55. A .125% reduction is applied for each year of age under the maximum age for the member's group.

10. SUMMARY OF PLAN PROVISIONS *(continued)*

DEFERRED VESTED BENEFIT

A participant who has attained the requisite years of creditable service can elect to defer his or her retirement until a later date. Group 4 employees cannot defer beyond age 65. All participants must begin to receive a retirement allowance or withdraw their accumulated deductions no later than April 15 of the calendar year following the year they reach age 70½.

WITHDRAWAL OF CONTRIBUTIONS

Member contributions may be withdrawn upon termination of employment. The interest rate for employees who first become members on or after January 1, 1984 who voluntarily withdraw their contributions with less than 10 years of service will be 3%. Interest payable on all other withdrawals will be set at regular interest.

DISABILITY RETIREMENT

The Massachusetts Retirement Plan provides 2 types of disability retirement benefits:

ORDINARY DISABILITY

Eligibility: Non-veterans who become totally and permanently disabled by reason of a non-job related condition with at least 10 years of creditable service (or 15 years creditable service in systems in which the local option contained in G.L. c. 32, s.6(1) has not been adopted).

Veterans with ten years of creditable service who become totally and permanently disabled by reason of a non-job related condition prior to reaching "maximum age". "Maximum age" applies only to employees classified in Group 4 who are subject to mandatory retirement.

Retirement Allowance: For persons who became members prior to April 2, 2012, the benefit is equal to the accrued superannuation retirement benefit as if the member was age 55. If the member is a veteran, the benefit is 50% of the member's final rate of salary during the preceding 12 months, plus an annuity based upon accumulated member contributions plus credited interest. If the member is over age 55, he or she will receive not less than the superannuation allowance to which he or she is entitled.

For persons in Group 1 who became members on or after April 2, 2012, the benefit is equal to the accrued superannuation retirement benefit as if the member was age 60. If the member is a veteran, the benefit is 50% of the member's final rate of salary during the preceding 12 months, plus an annuity based upon accumulated member contributions plus credited interest. If the member is over age 60, he or she will receive not less than the superannuation allowance to which he or she would have been entitled had they retired for superannuation.

10. SUMMARY OF PLAN PROVISIONS *(continued)*

ORDINARY DISABILITY *(continued)*

For persons in Group 2 and Group 4 who became members on or after April 2, 2012, the benefit is equal to the accrued superannuation retirement benefit as if the member was age 55. If the member is a veteran, the benefit is 50% of the member's final rate of salary during the preceding 12 months, plus an annuity based upon accumulated member contributions plus credited interest. If the member is over age 55, he or she will receive not less than the superannuation allowance to which he or she is entitled.

ACCIDENTAL DISABILITY

Eligibility: Applies to members who become permanently and totally unable to perform the essential duties of the position as a result of a personal injury sustained or hazard undergone while in the performance of duties. There are no minimum age or service requirements.

Retirement Allowance: 72% of salary plus an annuity based on accumulated member contributions, with interest. This amount is not to exceed 100% of pay. For those who became members in service after January 1, 1988 or who have not been members in service continually since that date, the amount is limited to 75% of pay. There is an additional pension of $897.72 per year (or $312.00 per year in systems in which the local option contained in G.L. c. 32, s. 7(2)(a)(iii) has not been adopted), per child who is under 18 at the time of the member's retirement, with no age limitation if the child is mentally or physically incapacitated from earning. The additional pension may continue up to age 22 for any child who is a full time student at an accredited educational institution. For systems that have adopted Chapter 157 of the Acts of 2005, veterans as defined in G.L. c. 32, s. 1 receive an additional benefit of $15 per year for each year of creditable service, up to a maximum of $300.

ACCIDENTAL DEATH

Eligibility: Applies to members who die as a result of a work-related injury or if the member was retired for accidental disability and the death was the natural and proximate result of the injury or hazard undergone on account of which such member was retired.

Allowance: An immediate payment to a named beneficiary equal to the accumulated deductions at the time of death, plus a pension equal to 72% of current salary and payable to the surviving spouse, dependent children or the dependent parent, plus a supplement of $897.72 per year, per child (or $312.00 per year in systems in which the local option contained in G.L. c. 32, s. 9(2)(d)(ii) has not been adopted), payable to the spouse or legal guardian until all dependent children reach age 18 or 22 if a full time student, unless mentally or physically incapacitated.

The surviving spouse of a member of a police or fire department or any corrections officer who, under specific and limited circumstances detailed in the statute, suffers an accident and is killed or sustains injuries while in the performance of his duties that results in his death, may receive a pension equal to the maximum salary for the position held by the member upon his death.

In addition, an eligible family member may receive a one-time payment of $300,000.00 from the State Retirement Board.

10. SUMMARY OF PLAN PROVISIONS *(continued)*

DEATH AFTER ACCIDENTAL DISABILITY RETIREMENT

Effective November 7, 1996, Accidental Disability retirees were allowed to select Option C at retirement and provide a benefit for an eligible survivor. For Accidental Disability retirees prior to November 7, 1996, who could not select Option C, if the member's death is from a cause unrelated to the condition for which the member received accidental disability benefits, a surviving spouse will receive an annual allowance of $6,000. For Systems that accept the provisions of Section 28 of Chapter 131 of the Acts of 2010 the amount of this benefit is $9,000 and for Systems that accept the provisions of Section 65 of Chapter 139 of the Acts of 2012 the amount of this benefit is $12,000.

DEATH IN ACTIVE SERVICE

Allowance: An immediate allowance equal to that which would have been payable had the member retired and selected Option C on the day before his or her death. For a member who became a member prior to April 2, 2012 whose death occurred prior to the member's superannuation retirement age, the age 55 benefit rate is used. For a member classified in Group 1 who became a member on or after April 2, 2012 whose death occurred, the age 60 benefit rate is used. If the member died after age 60, the actual age is used. The minimum annual allowance payable to the surviving spouse of a member in service who dies with at least two years of creditable service is $3,000 unless the retirement system has accepted the local option increasing this minimum annual allowance to $6,000, provided that the member and the spouse were married for at least one year and living together on the member's date of death.

The surviving spouse of such a member in service receives an additional allowance equal to the sum of $1,440 per year for the first child and $1,080 per year for each additional child until all dependent children reach age 18 or 22 if a full time student, unless mentally or physically incapacitated.

COST OF LIVING

If a system has accepted Chapter 17 of the Acts of 1997, and the Retirement Board votes to pay a cost of living increase (COLA) for that year, the percentage is determined based on the increase in the Consumer Price Index used for indexing Social Security benefits, but cannot exceed 3.0%. Section 51 of Chapter 127 of the Acts of 1999, if accepted, allows boards to grant COLA increases greater than that determined by CPI but not to exceed 3.0%. The first $12,000 of a retiree's total allowance is subject to a COLA. The total COLA for periods from 1981 through 1996 is paid for by the Commonwealth of Massachusetts.

Under the provisions of Chapter 32, Section 103(j) inserted by Section 19 of Chapter 188 of the Acts of 2010, systems may increase the maximum base on which the COLA is calculated in multiples of $1,000. Each increase must be accepted by a majority vote of the Retirement Board and approved by the legislative body.

10. SUMMARY OF PLAN PROVISIONS *(continued)*

METHODS OF PAYMENT

A member may elect to receive his or her retirement allowance in one of 3 forms of payment.

Option A: Total annual allowance, payable in monthly installments, commencing at retirement and terminating at the member's death.

Option B: A reduced annual allowance, payable in monthly installments, commencing at retirement and terminating at the death of the member, provided, however, that if the total amount of the annuity portion received by the member is less than the amount of his or her accumulated deductions, including interest, the difference or balance of his accumulated deductions will be paid in a lump sum to the retiree's beneficiary or beneficiaries of choice.

Option C: A reduced annual allowance, payable in monthly installments, commencing at retirement. At the death of the retired employee, 2/3 of the allowance is payable to the member's designated beneficiary (who may be the spouse, or former spouse who is unmarried at the time of retirement for a member whose retirement becomes effective on or after February 2, 1992, child, parent, sister, or brother of the employee) for the life of the beneficiary. For members who retired on or after January 12, 1988, if the beneficiary pre-deceases the retiree, the benefit payable increases (or "pops up" to Option A) based on the factor used to determine the Option C benefit at retirement. For members who retired prior to January 12, 1988, if the System has accepted Section 288 of Chapter 194 of the Acts of 1998 and the beneficiary pre-deceases the retiree, the benefit payable "pops up" to Option A in the same fashion. The Option C became available to accidental disability retirees on November 7, 1996.

ALLOCATION OF PENSION COSTS

If a member's total creditable service was partly earned by employment in more than one retirement system, the cost of the "pension portion" is allocated between the different systems pro rata based on the member's service within each retirement system. If a member received regular compensation concurrently from two or more systems on or after January 1, 2010, and was not vested in both systems as of January 1, 2010, such a pro-ration will not be undertaken. This is because such a person will receive a separate retirement allowance from each system.

11. GLOSSARY OF TERMS

ACTUARIAL ACCRUED LIABILITY

That portion of the Actuarial Present Value of pension plan benefits which is not provided by future Normal Costs or employee contributions. It is the portion of the Actuarial Present Value attributable to service rendered as of the Valuation Date.

ACTUARIAL ASSUMPTIONS

Assumptions, based upon past experience or standard tables, used to predict the occurrence of future events affecting the amount and duration of pension benefits, such as: mortality, withdrawal, disablement and retirement; changes in compensation; rates of investment earnings and asset appreciation or depreciation; and any other relevant items.

ACTUARIAL COST METHOD (OR FUNDING METHOD)

A procedure for allocating the Actuarial Present Value of all past and future pension plan benefits to the Normal Cost and the Actuarial Accrued Liability.

ACTUARIAL GAIN OR LOSS (OR EXPERIENCE GAIN OR LOSS)

A measure of the difference between actual experience and that expected based upon the set of Actuarial Assumptions, during the period between two Actuarial Valuation dates.

Note: The effect on the Accrued Liability and/or the Normal Cost resulting from changes in the Actuarial Assumptions, the Actuarial Cost Method, or pension plan provisions would be described as such, not as an Actuarial Gain (Loss).

ACTUARIAL PRESENT VALUE

The dollar value on the valuation date of all benefits expected to be paid to current members based upon the Actuarial Assumptions and the terms of the Plan.

AMORTIZATION PAYMENT

That portion of the pension plan appropriation which represents payments made to pay interest on and the reduction of the Unfunded Accrued Liability.

11. GLOSSARY OF TERMS *(continued)*

ANNUAL STATEMENT

The statement submitted to PERAC each year that describes the asset holdings and Fund balances as of December 31 and the transactions during the calendar year that affected the financial condition of the retirement system.

ANNUITY RESERVE FUND

The fund into which total accumulated deductions, including interest, is transferred at the time a member retires, and from which annuity payments are made.

ANNUITY SAVINGS FUND

The fund in which employee contributions plus interest credited are held for active members and for former members who have not withdrawn their contributions and are not yet receiving a benefit (inactive members).

ASSETS

The value of securities as described in Section VIII.

COST OF BENEFITS

The estimated payment from the pension system for benefits for the fiscal year. This was the minimum amount payable during the first six years of some funding schedules.

FUNDING SCHEDULE

The schedule based upon the most recently approved actuarial valuation which sets forth the amount which would be appropriated to the pension system in accordance with Section 22(6A), Section 22D or Section 22F of M.G.L. Chapter 32.

GASB

Governmental Accounting Standards Board

11. GLOSSARY OF TERMS *(continued)*

NORMAL COST

Total Normal Cost is that portion of the Actuarial Present Value of pension plan benefits, which is to be paid in a single fiscal year. The Employee Normal Cost is the amount of the expected employee contributions for the fiscal year. The Employer Normal Cost is the difference between the Total Normal Cost and the Employee Normal Cost.

PENSION FUND

The fund into which appropriation amounts as determined by PERAC are paid and from which pension benefits are paid.

PENSION RESERVE FUND

The fund which shall be credited with all amounts set aside by a system for the purpose of establishing a reserve to meet future pension liabilities. These amounts would include excess interest earnings.

SPECIAL FUND FOR MILITARY SERVICE CREDIT

The fund which is credited with amounts paid by the retirement board equal to the amount which would have been contributed by a member during a military leave of absence as if the member had remained in active service of the retirement board. In the event of retirement or a non-job related death, such amount is transferred to the Annuity Reserve Fund. In the event of termination prior to retirement or death, such amount shall be transferred to the Pension Fund.

UNFUNDED ACCRUED LIABILITY

The excess of the Actuarial Accrued Liability over the Assets.

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